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The attention of the members of the A. S. P. is especially directed to this catalogue, as the study of variable stars affords one of the most promising fields of work for amateur astronomers. The optical aid needed for most of the stars is within the reach of all, and, as Dr. CHANDLER says, "the work of the accurate observation of the phenomena, which, as in the case of the comets, is of a much higher grade than the discovery of new objects—is the most essential element in the progress of this branch of astronomy, and is a field affording ample room for more participants." For this work the new catalogue is almost indispensable.

R. G. AITKEN.

ASTRONOMICAL TELEGRAMS.

Telegram received Sunday, June 21, 9 P. M.

[TRANSLATION.]

To LICK Observatory:

BROOKS' periodic comet has been observed on its return by JAVELLE, at Nice, on June 20. 5751.

R. A. 22^h 25^m $38^s.0$
Dec. $-18°$ $33'$ $59''$

(Signed) JOHN RITCHIE, JR.

THE CROSSLEY TELESCOPE.

The large mirror was placed in position in the telescope on June 12, 1896.

W. J. HUSSEY.

ON THE DETERMINATION OF PLANETARY DIAMETERS.

M. BIGOURDAN of the Paris Observatory has recently completed an extensive series of diameter measures of *Jupiter's* satellites. His results are of great value, not so much on the score of determining the size of the satellites, but as a timely contribution to the general problem of Diameter Determination.

Astronomers have devoted a great deal of time to measuring the diameters of our planets and their satellites. The micrometer measures obtained are converted into arc, corrected for differential refraction, phase and distance, and the results thus secured are generally called Diameter. The method is convenient, leading to speedy results; but how much are the results worth? Very

little, so long as no special pains are taken to eliminate the numerous systematic errors.

Let us suppose it is a question of determining the diameter of *Jupiter's* Satellite I, by micrometer measurements. The telescope forms an image of the satellite; but the image is *always too large*, owing to spherical aberration, chromatic aberration, diffraction, imperfect focusing, poor seeing. It is for the observer to measure the diameter of this image. But the image, already too large, is in effect still further enlarged by irradiation. The measures obtained refer not to the satellite, but to its enlarged image, and then include also the observer's personal error.

A few years ago an excellent observer made an excellent series of diameter measures of *Mars* for the purpose of determining the polar flattening. While the measures no doubt gave an excellent value of the polar flattening, the observer noticed that his measures of the diameter were 1½ seconds of arc larger than they should be according to the best determinations. A few years later he made another series of measures of the same planet, but using a larger telescope. His measures were about ⅘ second of arc greater than the generally accepted value. Scores of similar instances could be quoted showing that diameters are generally deduced too great.

A few observers have investigated their systematic errors, and have attempted in some cases to reduce their magnitude and in others to eliminate them entirely. In this connection M. BIGOURDAN'S measures of *Jupiter's* satellites are very important. He made three sets of observations:

1st. Before or during the setting of the Sun.

2d. Between sunset and dark.

3d. After dark, with field artificially illuminated.

His results for the four satellites, from long series of measures, are:

	I.	II.	III.	IV.
	″	″	″	″
Before sunset,	0.713	0.655	1.250	1.124
After sunset,	0.820	0.729	1.342	1.241
After dark,	0.893	0.851	1.551	1.356

The increase of the apparent diameter, as the darkness of the sky increased, is very evident. We need not look far for the reason. The satellites are bright. When they are observed on a bright-sky background, the effects of chromatic aberration, irradiation, etc., are largely reduced. His measures after dark are twenty-

five per cent. greater than those made on the bright sky; and although the night measures agree well with those obtained by other observers,* it seems to me that the daylight measures are much nearer the truth.

Daylight measures possess many of the advantages of heliometer or other double-image measures, and do not have their principal disadvantages. In the cases of *Venus* and *Mars*, and possibly some other of the nearer bodies, the great range in distance from the Earth enables us to eliminate the systematic errors very satisfactorily. For the more distant bodies the errors cannot thus be eliminated. In such cases — as well as in all cases — the observer is bound to reduce the magnitude of the systematic errors as far as possible. One of the most effective methods, in my judgment, is to make the observations when the Sun is above the horizon.

In 1894 I measured the diameter of *Mars*, (*a*) on the dark sky, (*b*) between daylight and sunrise, and (*c*) with the Sun well above the horizon. The advantages of the bright-sky background were very marked. Measures made with the utmost care at night, on the dark background, were systematically 0″.3 to 0″.7 greater than those made after sunrise. Measures made between dawn and sunrise progressively decreased as the sky brightened. From my discussion of a long series of observations made after sunrise, it appeared that their systematic error was 0″.05, whereas the systematic error of the night measures was about 0″.6.

W. W. CAMPBELL.

PROFESSOR KRUEGER.

CARL NICOLAUS ADALBERT KRUEGER, whose death was announced in a recent number of the *Astronomische Nachrichten*, was born at Marienburg, in Prussia, in 1832; was educated at Elbing and Wittenburg and at the University of Berlin. At the age of twenty-one, he was appointed assistant at the Bonn Ob-

* The principal values obtained by other observers are:

	I.	II.	III.	IV.
	″	″	″	″
W. STRUVE,	1.015	0.911	1.488	1.273
MÆDLER,	1.200	1.132	1.519	1.300
ENGLEMANN,	1.08	0.91	1.54	1.28
SECCHI,	0.985	1.054	1.609	1.496
HOUGH,	1.11	0.98	1.78	1.46
BURNHAM,	1.11	1.00	1.78	1.61
MICHELSON,	1.02	0.94	1.37	1.31
BARNARD,	1.048	0.874	1.521	1.430